

REMARKS

In paragraph 2 of the Office action, claims 1-13 and 31-41 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-13, and 31-37 of copending Application No. 10/689,256. As this is a provisional rejection, this rejection will be addressed when the § 101 rejection has been overcome.

In paragraph 4 of the Office action, claims 1-13 and 31-41 stand rejected under 35 U.S.C. § 101 “because the claimed invention is directed to non-statutory subject matter.” It is respectfully submitted that the Office has performed a partial and incorrect analysis under § 101.

Step 1– Determine Whether the Claimed Invention Falls Within an Enumerated Statutory Category (Interim Guidelines, Section IV-B, page 14)

In paragraph 4 of the Office action, the examiner states:

In order for a claimed invention that merely performs calculations and manipulations of data to be statutory, the claimed invention must accomplish a practical application, that is not directed to a preemption of a calculation and/or manipulation [of] data.

This “starting point” is improper for two reasons:

1. The examiner concludes, without any reference to the claim language, that the claimed invention merely performs calculations and manipulations of data; and
2. The examiner assumes, without citation to any authority, that an otherwise statutory process and an otherwise statutory article of manufacture becomes nonstatutory because the method and/or article of manufacture performs calculations and manipulations of data.¹

A proper analysis under § 101 starts with the inquiry “does the claimed invention fall within one of the four statutory categories?” The Office must determine “what has the inventor invented?” The answer to that question is that claim 1 recites real world method steps for controlling the operation of an n-dimensional array of processing elements while claim 31 recites

¹ Indeed, the opposite is true: “A claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer.” Diamond v. Diehr, 450 U.S. 175, 187 (1981).

hardware in combination with functional language, an approach approved by the Interim Guidelines (see Interim Guidelines, page 15). On the basis of the plain language of these claims, these claims fall within the statutory categories of process and article of manufacture, respectively.

The examiner is respectfully reminded that the Interim Guidelines place the burden on the Office of establishing a *prima facie* case of unpatentability. As stated in the Interim Guidelines at page 16:

Therefore if the examiner determines that it is more likely than not that the claimed subject matter falls outside all of the statutory categories, *the examiner must provide an explanation.* (emphasis added)

To advance the prosecution of this application, and to present a complete record for appeal, the examiner is respectfully requested to place in the record an explanation of why claim 1 is not a process and why claim 31 is not an article of manufacture.

Step 2 – Determine Whether the Claimed Invention Falls Within a Judicial Exception – Laws of Nature, Natural Phenomena, and Abstract Ideas

The next step in the analysis is to determine if the claimed invention falls within a judicial exception. The three judicial exceptions are laws of nature, natural phenomenon, and abstract ideas. The subject matter of claims 1 and 31 clearly is not a law of nature or natural phenomenon. A claim that recites a single step of “finding a maximum value” might be said to represent an abstract idea. A claim, like claim 1, that recites how and in what sequence hardware is operated to find a maximum value is a practical implementation of the abstract idea. Article of manufacture claim 31 is hardware, not an abstract idea. Because method claim 1 and article of manufacture claim 31 fall within statutory categories, and do not recite a law of nature, natural phenomenon, or abstract idea, the analysis under § 101 is satisfied.

Step 3 – Determine if the Claimed Subject Matter is a Practical Application of a Judicial Exception

As stated above, because the claims are statutory and do not fall within one of the judicial exceptions, the analysis need go no further. However, to provide a complete response, and assuming that the Office:

provides an explanation of why the claims are non-statutory, and

provides an explanation of why the claims fall within one of the judicial exceptions, it is applicant's position that the claimed subject matter represents a practical application and is therefore patentable as discussed below.

Step 3A – Does the Claim Recite an Useful, Tangible, Concrete Result?

One way to establish whether claimed subject matter is a practical application of a judicial exception is to use the “useful, tangible, concrete test” used in the Office action. In determining whether the claim is for a practical application, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather whether the final result achieved by the claimed subject matter is useful, tangible, and concrete. (Interim Guidelines, page 20)

The Office action states:

The extrema produce[d] by the claimed invention is not a real world result but merely a numerical value without a practical application recited in the claims that makes the result useful, concrete and tangible.

This statement assumes the conclusion and uses the conclusion to drive the fact finding. Instead, the Office should have done an analysis of whether a result was claimed that was useful, tangible, and concrete and then used the results of that analysis to conclude that the claim does or does not recite a practical application.

Useful

There is no specific allegation in the Office action regarding lack of utility. A method and an article of manufacture for extracting a maximum or minimum value from an n-dimensional array of processing elements is, based on the plain language of the claims, a useful exercise.

Concrete

Concrete merely means repeatable. As with the “useful” prong of the test, there is no specific allegation that the method is not repeatable, nor could there be. This prong of the test is met by the pending claims.

Tangible

The tangible requirement does require that the claim must recite more than a § 101 judicial exception, in that the process claim must set forth a practical application of that § 101 judicial exception to produce a real world result. (Interim Guidelines, page 21.) This, now, is the crux of the examiner's position. As stated in the Office action at the bottom of page 3:

The inputs are numbers and the output is also a number. The extrema produce[d] by the claimed invention is not a real world result but merely a numerical value without a practical application recited in the claims that makes the result useful, concrete and tangible.

The examiner's position is an improper over-extension of the law. The examiner cites In re Alappat, 33 F.3d 1526, 31 USPQ2d 1545 (Fed. Cir. 1994) as an example of claims that recite a practical application. Claim 15 from Alappat recites:

15. A rasterizer for converting vector list data representing sample magnitudes of an input waveform into anti-aliased pixel illumination intensity data to be displayed on a display means comprising:
- (a) means for determining the vertical distance between the endpoints of each of the vectors in the data list;
 - (b) means for determining the elevation of a row of pixels that is spanned by the vector;
 - (c) means for normalizing the vertical distance and elevation; and
 - (d) means for outputting illumination intensity data as a predetermined function of the normalized vertical distance and elevation.

The input in claim 15 of Alappat is vector list data (numbers), just like the instant claim 1.

Alappat's claim 15 never says what the vector list data is representative of, just as claim 1 is silent about what the n-dimensional array of numbers is representative of.

The body of claim 15 recites the movement and calculation of data, just like the instant claim 1.

The output of claim 15 is pixel illumination intensity data (numbers); the output of claim 1 is an extrema value. Just as pixel illumination data can be useful for subsequent unspecified steps, applicant's extrema value can be useful for subsequent unspecified steps. See:

U.S. Patent No. 6,678,390 - Method and Computer Program for Embedding and Extracting an Embedded Message from a Digital Image - FIG 6., Ref. No. 60, Col. 4, lines 22-46.

U.S. Patent No. 6,173,069 - Method for Adapting Quantization in Video Coding Using Face Detection and Visual Eccentricity Weighting - Col. 13, lines 30-38.

U.S. Patent No. 7,040,146 - Soil or Snow Probe (Avalanche Detection) - Col. 6, lines 60-67.

If the examiner believes that pixel illumination data is a real world application, the examiner should answer the question, pixel illumination data of what? The answer from claim 15 of Alappat is pixel illumination data of unspecified waveforms that are not tied to any real world application. Claim 15 of Alappat converts unspecified waveform data into illumination data. Applicant's claim 1 converts an n-dimension array of unspecified data into extrema data. That the extrema data may not be the final output, but rather the input to another step or process is, at most, a difference of degree and not kind from the subject matter found patentable in Alappat. Applicant's claims 1 and 31, like Alappat's claim 15, recites patentable subject matter.

Should the examiner disagree with this position, the examiner is respectfully requested to place an explanation in the record as to why method claim 1 and article of manufacture claim 31 are not practical applications of the concept of finding a maximum or minimum within an n-dimensional array of processing elements containing data.

Preemption – Determine Whether the Claimed Invention Preempts an Abstract Idea, Law of Nature, or Natural Phenomenon

In this part of the analysis, a determination must be made as to whether the claims cover a judicial exception in their entirety. The examiner again starts with the premise that because the claims fail to limit the invention to any practical application, they appear to cover every substantial practical application, and thus are also directed to a preemption of the claimed manipulation and calculations of data. This statement simply fails to take into account the language of the claim.

Apparently the examiner is asserting that every calculation of an extrema must be performed so as to include:

determine within each of said processing elements in an n-dimensional array of processing elements a local extrema for each of said processing elements wherein each of the local extrema must have a most significant byte and a least significant byte;

and

serially output in bursts said most significant bytes and said least significant bytes of said local extrema from each of said processing elements to a neighboring processing element until every processing element in a first dimension has received all local extrema along said first dimension;

and

determine within each of said processing elements a first dimensional extrema for said first dimension of said n-dimensional array, wherein said first dimensional extrema is determined from a plurality of local extrema most significant bytes and least significant bytes stored in said processing elements in said first dimension and wherein said first dimensional extrema has a most significant byte and a least significant byte.

Clearly, there are plenty of ways to calculate extrema that do not require these steps. For example, a first processing element could pass its value to an adjacent processing element. The adjacent processing element compares the received value to its value, and passes along only the maximum (or minimum) value to the next processing element, and so on down a line of processing elements. It is respectfully submitted that the Office's preemption argument is conclusory, unsupported by the language of the claims, and unsupported by any reasonable application of the law.

Conclusion

It is believed that when the claims are looked at in their entirety, rather than narrowly focusing on the calculation and/or manipulation of data, it is seen that the pending claims satisfy the Interim Guidelines for subject matter eligibility.

Request for Interview

Applicant has made a diligent effort to place the instant application in condition for allowance. If the examiner is of the opinion that the instant application is in condition for disposition other than through allowance, the examiner is respectfully requested to contact applicant's attorney at the telephone number listed below **so that an interview may be scheduled before the issuance of a first Office action rejection on the § 101 issue.**

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'EJ Pencoske', written in a cursive style.

Edward L. Pencoske
Reg. No. 29,688
Jones Day
One Mellon Center
500 Grant Street, 31st Floor
Pittsburgh, PA 15219
Telephone: (412) 394-9531
Fax: (412) 394-7959